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GEOGRAPHIC INFLUENCES IN THE DEVELOPMENT OF OHIO

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THE geographic influences that have weight in the human history of a small political division of a continent may be discussed under two heads: (1) Inherent, or inevitable: (2) Extraneous, or influences due to geographic position.

Inherent Influences	Extraneous Influences
1. Climate	1. Relation to Atlantic Seaboard
2. Topography	2. Relation to Mississippi Basin
3. Mineral Products	3. Bearing of the Steel Industry
4. Soil	4. Relation to Markets

Inherent Influences

Climate. Ohio extends through about 3½ degrees of latitude; its mean isotherms have a range of approximately seven degrees, 48°—55°. The northern part of the state, bordering Lake Erie, has a later date for spring low temperatures, as well as for the fall frosts, a condition highly favorable to fruit-growing. The average precipitation for the state is 38.4 inches; certain areas have more precipitation than others, a difference some years of 10 to 15 inches. Only in the higher altitude does the winter snow accumulate to any great depth, but throughout most of the state there usually is sufficient snowfall to protect the winter wheat.

Topography. The surface features of Ohio give variety to its landscape, and figure also in its temperature. Extending southwestward from Lake Erie, as well as bordering its south shore, is the Lake plain section, a region of former extensive swamps, which, under man's work, have become rich agricultural and meadow lands; the general level of this Lake plain is from 600 to 800 feet. The surface altitude increases southward, but irregularly. A topographic map of the state shows five north-south blocks that are over one thousand feet in altitude; the intervening lower

*A somewhat different treatment of this topic by the same writer may be found in *Popular Science Monthly*, Vol. LXXV, 1909, pp. 473—487.

tracts have been very important in the development of industrial centers, because they have directed the course taken by transportation routes, both canals and railways. These north-south blocks of higher altitude increase in irregularity from west to east; the most eastern one is very ragged, but does not contain any east-west gaps north of the Ohio River in Washington County. The relative backwardness of the southeastern part of the state is quite largely a matter of topography.

The important geographic influences in Ohio's topography may be summarized thus:

1. The Ohio River valley was a convenient means of access for pioneers. With the introduction of steam boats in 1811, it facilitated the marketing of products via the Mississippi River and the purchase of groceries at New Orleans, though previous to this, much commerce took the same route in flatboats, keel boats, and barges.

2. The opening of the Erie canal through the Mohawk route to Lake Erie brought out the possibilities of canals in Ohio as feeders of lake traffic. The north-south gaps in Ohio directed the course taken by canals connecting the Lake and Ohio River, thus completing an inland water route from New Orleans to New York City, but in effect diverting trade from the former city.

3. The lake plain was a natural gap for the westward continuation of railroads whose original purpose was speedy year-round transportation between Buffalo, then the most important lake port, and New York City.

4. The configuration of the upper Ohio River basin focused "through" railroad lines from Philadelphia and Baltimore across central and southern Ohio. The northern tributaries of this basin formed relatively easy routes for railroads which were to connect the Ohio River and Lake Erie.

5. The increasing width of the lake plain, as it extends westward across the state, and the general southwest direction of the Allegheny plateau, account for the divergence of railways from the lake front, and the resulting abundance of transportation facilities in the western portion of the state.

MINERAL PRODUCTS. The marketable mineral wealth of a State is an index of its rank. In the development of Ohio, however, minerals have had a sporadic influence. In the early decades, local iron ores were reduced, and manufactured into many common necessities of households; the ore was not of a high grade, but stoves, cooking utensils, etc., could be made from it, whereas similar manufactures from the east were prohibitive, because of transportation charges. Under the competition of Lake Superior ores, the working of local mines gradually ceased; in recent decades the mining of iron ore in Ohio has continued only in the Hanging Rock area of Lawrence County.

The most valuable mineral asset of Ohio is its coal. Coal mines have been worked commercially from about 1830. Those of the northern part

of the State supplied Cleveland with coal, delivered by boats on the Cuyahoga River. The mines that could be reached conveniently from the Ohio River were drawn on largely by the river towns, even as far as New Orleans.

Natural gas, which came into commercial importance about 1884, brought speedy wealth to some communities of the state, but to others financial disaster. The first important gas fields were discovered in the northwestern part of the state. In spite of the waste, and the reckless financing, Ohio has profited through the influence of its natural gas. Scores of factories, built during the gas-boom period, have been adjusted to normal conditions, and have found a permanent place in our industry.

Since 1860 Ohio has been marketing crude petroleum; but the quantity produced did not become significant till the northwest part of the state was exploited for gas. Many of the early gas wells also supplied some petroleum, and frequently, after the gas gave out, the well was pumped for the oil. Northwestern Ohio has been the most important region of the state in the production of oil, though some wealth has accumulated from this fuel in the central and southeastern parts. About 400 million 42-gallon barrels is the crude petroleum output of Ohio since 1875.

A much greater source of wealth is found in the clays which have been worked, for a variety of products, so extensively that for many years Ohio has been the foremost state in the clay industry. An important, though by no means decisive, reason for this rank is the abundance of raw clay, part of which is of glacial origin, and part is consolidated rock. The cheap fuel, gas and coal, and the facilities for shipping the tile, brick, and pottery, have contributed very much to this influence in the economic growth of the state.

During the last two decades the extensive salt deposits that underlie some sections of the state have come into commercial importance, the state ranking either third (since 1903) or fourth in the quantity produced annually. The margin in marketing salt is so narrow that other factors than the presence of the mineral decide whether the resource shall be worked commercially. Adjacency to centers of population, and shipping facilities for the finished product, are decisive factors in the development of the salt industry.

Soil. Ohio is known as an agricultural state. Two-thirds of the state's area bears a mantle of glacial drift, the debris acquired by the Continental glacier in its sweep across a great variety of rocks; this glacial soil contains a wide range of plant food. In one other particular, glaciation has been an aid in agriculture; even in the parts of the state not reached by ice, the valleys were silted up by streams which flowed southward from the glacier, developing wide flood plains, of great agricultural value.

But the soil capacity of a state alone does not insure wealth from agriculture. It is only after lines of transportation have been built, reaching thickly-settled areas, that farmers are encouraged to raise cereals and fruit for distant markets. In Ohio, not until the canal days did the growing of crops come to be of any more than local importance. Shortly afterwards, the building of railroads still further encouraged farming; then the state commenced to show how important is rich soil as a geographic influence in its development.

In 1900, Ohio ranked third in the gross value of its agricultural products (the summaries of the last census are not available); second in onions and in eggs, third in wheat, fourth in tobacco, and fourth in the acre-yield of oats and corn, standing sixth and seventh respectively in the gross yield of these two cereals. Aside from the great crops of cereals grown, several sections of the state are given largely to pasturing and to dairying; in 1910 the pasture lands covered over one-third of the state. Feeding cattle for distant markets brought Ohio farmers their first wealth; the stock could be fattened and herded, whereas it was not profitable to raise grain, as, in the absence of canals or railroads, the crops could not be marketed. For this reason, extensive pasture lands were maintained in the agricultural areas, even from the days of the pioneer. One result of this, was the early development of the meat-packing industry at Cincinnati. For many years hogs especially were slaughtered at Cincinnati, the pork salted and sent to Europe or to the eastern ports by way of the Mississippi river.

Influences Arising From Geographic Position

The larger features of a continent may sometimes bear a peculiar relationship to a small portion of that continent. The economic development of that small portion will then be quite as much a matter of geographic position as of natural resources.

Relation to the Atlantic Seaboard. Because of the north-south direction of the Atlantic seaboard, the charter boundaries of the original colonies extended east-west. This political condition to some extent was a factor in the trans-Appalachian settlements. The solid intense growth made by the British colonies was imposed by the narrow strip in which this growth was made, a strip between the Atlantic and the Appalachian mountains. With the over-settlement of the coast colonies, a fringe of frontier settlements pushed gradually across the mountain barrier. Once over this barrier, the river valleys invited the frontiersmen easily into more desirable territory.

The converging of these valleys, the Allegheny, Monongahela, Great and Little Kanawha, Sandy, and the Licking, towards what is now the state of Ohio, was a factor in the early trans-Appalachian settlements being located first on the south, and later the north side of the Ohio river;

contributing to the same end, is the further fact that during the later colonial and all the continental periods, the Atlantic colonies between and including Pennsylvania and North Carolina were relatively the most thickly settled. The Appalachian barrier was easily crossed through the Mohawk Gap, but settlements were made along the route and over the lake plain of western New York first; later pioneers, taking this road across the Appalachians, spread along Lake Erie and into the Ohio part of the Erie basin.

The upper Great Lakes flow into the Erie basin; the influence of this physiographic condition is seen in the trade routes of the French, and in the military movements of the British.

Another consequence of these physiographic features, noted in the convergence of so many Appalachian passes and valleys towards the Ohio region, may be seen by consulting a modern railroad map: all the trunk lines that cross the Appalachians north of the Carolinas converge towards either the Ohio valley or the Lake Erie basin.

Relation to the Mississippi Basin. The fertile lands of the Mississippi river system have become the granary of the United States and to some extent also of Europe. Farm lands supply food for urban communities, and produce wealth for the farmer, thereby stimulating manufacturing and transportation. The country's granary should also be one of its important markets.

The convenient fuel supply (Pennsylvania coal) of the Northern Atlantic States, and the abundant water power of their rivers, led that portion of our country early into manufacturing. Furthermore, the rich farms of the Mississippi basin were a handicap to agriculture in the seaboard states as soon as shipping facilities established competition. The older settlements, therefore, directed their energies along the line of manufacturing, and of establishing commercial relations with the Mississippi basin. Ample transportation routes were required, that the food might be delivered to the seaboard, and the manufactured goods delivered to the western markets. The Appalachian passes were utilized in railroad building; as already shown, these passes converge towards the Ohio; consequently, nearly all the through railroads, connecting the Mississippi and the Atlantic, cross Ohio. The segments of these railroads within the state of Ohio have been of inestimable importance in the development of the state, and their presence is due quite entirely to the fact that Ohio lies athwart the natural routes which connect the commercial and manufacturing seacoast cities with the agricultural West.

Relation to the steel industry. This industry had its first important development in western Pennsylvania. In and about Pittsburg it acquired a momentum that has outlived the conditions which gave it birth and for a time sustained it. For several decades the iron mines of the Lake Superior region have been supplying ore for the blast furnaces in

western Pennsylvania. This ore is shipped to some lake port in northern Ohio, and then trans-shipped by rail to that steel center. The most expensive part of the haul is the relatively short distance across from Lake Erie to the Upper Ohio basin.

For many years Cleveland was the chief lake port in trans-shipping the ore. The railroads carrying it had to rise over a heavy grade from the Lake plain across to the Ohio river valley. Later other ports grew in importance, among them Lorain, Conneaut and Ashtabula. The last two places are farther from the ore mines but nearer the reduction plants in the Ohio basin. Furthermore, the railroad haul from Ashtabula involves less grade and consequently less expense; for several years this port has received more ore than any other lake port.

This traffic in iron ore across the state has been an advantage to Ohio, an advantage due to geographic position. In recent years, blast furnaces are being erected along the lake front; the coke, used in ore reduction, is carried to the lake, always at a lower expense than is involved in transporting iron ore from the lake ports to the steel plants in the Ohio valley. It seems probable, therefore, that in time Ohio will receive even more profit and markets. The relative values of these factors vary according to the Superior ore mines.

Relation to Markets. The chief factors involved in manufacturing are fuel supply or some method of energizing machinery, raw material, and markets. The relative values of these factors vary according to the goods being considered. Some raw material cannot be transported great distances with success; then the factories must be located near the areas that produce the raw material. In some cases the cost of the goods to the middle man is controlled more by the freight rates on the finished article; when this is true, the factories are located in reference to markets.

In general, the density of population is the measure of markets. In this age of industry, density of population implies transportation facilities. The center of population for over half a century has been in or near Ohio. The through railroad lines, built largely in the interests of the Atlantic ports and industrial centers, have also stimulated manufacturing in Ohio. Because of the ample shipping facilities for reaching markets, the abundant or easily procurable raw products, the low lake and river freight rates, stability in the supply of labor insured by a normal equilibrium between wages and the cost of reasonable living, Ohio has assumed a high rank—fourth in 1910—as a manufacturing state.

Ohio has long been famous for her mounds of early Indian construction. Among the many, Serpent mound at Peebles, and Fort Ancient in Warren County are the most famous.

Kelleys Island near Sandusky has some of the most famous glacial grooves and furrows in the United States.

MINERAL RESOURCES OF OHIO

By J. A. Bownocker, State Geologist

THE mineral resources of Ohio are varied and extensive, though restricted almost entirely to the non-metalliferous group. The more important varieties follow:

1. Soils
2. Fuels
   - (1) Coal
   - (2) Petroleum
   - (3) Natural gas
   - (4) Peat
3. Clays
4. Building stone
5. Materials for lime and Portland cement
6. Salt

Soils

The most valuable and enduring of the resources of Ohio is the soil. It may be divided into two general classes, (1) residual soils and (2) transported soils. The latter are by far the more extensive and include the best soils of the state. To this division is assigned the soils of glacial origin which cover about three-fourths of Ohio.

Glacial or Drift Soils: Along the shore of Lake Erie is a strip varying in width from a few miles in northeastern Ohio, to 50 miles in the northwestern corner, over much of which the soil is a fine loam. This is well suited for gardening and general farming. It has the advantage also of the moderating influence of the lake which prevents late spring frosts and the rigors of winter. Largely on this account the lake shore is extensively given to the growing of grapes, peaches and other fruits. Gardening is practiced in the large way in the vicinity of Cleveland and to a smaller extent near Sandusky and other smaller cities.

The soils of the northeastern part of the state and south of the loams of the lake plain are often clayey and hence wet and hard to work. In places, however, the soil contains enough sand and gravel to insure air and water drainage and then may be of excellent quality, as parts of Summit county. Farther south and west the soil becomes more sandy, due to the underlying rock, and then does very well for general farming. Good examples of this type may be found in Richland, Knox and Licking counties.

Western Ohio has a limestone floor and is covered with drift and for these reasons the soil is choice. In fact it ranks among the very finest tracts of its size in the United States. Valley soils in this territory are unusually fine and those of the Miami and Scioto are notably good. General farming is practiced, but corn in particular does well. Tobacco is grown on a large scale in Montgomery, Darke, Brown and other counties.

Non-Transported or Residual Soils. These are to be found on the hills or uplands in southeastern Ohio. Since foreign material has not been added the character of the soil is dependent on the bed rock which

consists in large part of sandstones and shales with some limestone. Soils derived from the first two named rocks are likely to be rather poor, but those derived from limestone may be very good. Farmers understand this and state with pride that their "farm is a limestone one." Such soils are found in parts of Jefferson, Harrison, Belmont, Monroe, Noble, Morgan and Athens counties. Unfortunately the topography is usually rough, making the soil wash badly and sometimes prevents the use of up to date farm machinery.

General farming is followed but the results, as a rule, are unsatisfactory. What should be done is an open question, but in the writer's judgment grazing, poultry raising and fruit growing promise well.

Fuels *

Second in value to the soils are the fuels—coal, petroleum, natural gas and peat.

Coal. Until the invention of the steam engine little use was made of coal, though its properties and uses were understood for centuries. With the construction of railroads its demand grew rapidly, so that a former State Geologist referred to coal as the "mainspring of our civilization."

Ohio has large coal deposits and the state ranks fourth in output. The principal coal fields of the state are the following:

Southern Ohio field. This includes parts of Jackson, Vinton, Lawrence and Gallia counties, and yields some of the best coal of Ohio.

The Meigs County field. The area of this is small; farther north and west, it is too thin for mining in a large way.

Athens, Perry and Hocking counties; thickness of the coal 4 to 6 feet; Athens, Perry and Hocking counties; thickness from four to six feet; quality, good though not the best. The field began to be worked in the large way about 1870 and is now past its zenith.

The Hocking Valley field. This great field includes parts of Athens, Perry and Hocking counties; thickness of the coal, 4 to 6 feet; quality, good; field worked since about 1870; now past its zenith.

The Coshocton-Tuscarawas field. The coal is thinner than in the Hocking Valley field, but the quality is slightly better.

The Massilon field. Named from Massillon, Stark County, the center of the field. The coal is of excellent quality but the seam is rather thin and the quantity remaining small.

The Cambridge field. This extends from near Cambridge, Guernsey County to Caldwell, Noble County. The coal does not make a first class coke and is too soft to bear transportation well. However, it is suitable for general fuel purposes and has a large market. This field is probably at its zenith.

*The following pages will be rendered more intelligent by consultation with the Geological Map of Ohio, which may be secured for 25 cents (stamps not accepted) from the State Geologist, Columbus, Ohio.

THE BELMONT COUNTY FIELD. This includes nearly the whole of Belmont County and parts of surrounding counties. This field rivals the Hocking Valley for first place in Ohio and its production will probably increase faster than that of any other field in our state. This was the last great field to be developed, and it will probably be a large producer after the other fields named have been exhausted.

While Ohio has extensive coal deposits they are anything but inexhaustible. Not only is more coal mined each year than during the preceding one but the increase is very rapid, jumping from 11,500,000 tons in 1890 to 26,270,000 tons in 1908. It is this rapid increase that is alarming. One hundred years hence all the great fields of Ohio will be practically exhausted and a century later will find our state without coal.

PETROLEUM. This invaluable fuel was discovered in Northwestern Pennsylvania in 1859. A year later a successful well was drilled near Macksburg in the northern part of Washington County and the industry in Ohio dates from that time and place. The producing territory was slowly extended until at present it extends from Columbiana County on the north to Washington on the south.

Of course oil is not found everywhere in this large area; but usually occupies relatively small, separate tracts known as pools. The wells vary in depth from less than 100 feet to about 2,500. Wells starting at 500 barrels per day have been very rare, and the operator who secured a 100-barrel well rejoiced.

In 1885 oil was discovered in the Trenton limestone at Findlay, natural gas having been found there a year earlier. Wells were sunk in rapid succession making the production greatly in excess of the demand, and decreasing the price of oil until it fell to about 15 cents per barrel. Wells are still being sunk, but probably a half dozen old ones are abandoned to where a good one is completed. This field gave Ohio the first rank among oil producing states, but the steady decrease of the wells during the past ten years is largely responsible for loss of that rank and in all probability it will not be regained. The wells in northwestern Ohio usually range from 900 to 1,400 feet in depth, while the initial daily production has varied from a few barrels to thousands, though the latter were anything but common.

A few years ago oil was discovered in the Clinton sand near Bremen, Fairfield County, and drilling is still very active. These wells are very deep, from 2,000 to 3,500 feet, and hence expensive. This sand is now being tested northward to the lake and south to the Ohio River. Further important discoveries may be made.

From what has been said it is clear that Ohio has passed the zenith in oil production and while the state will yield the fuel in large quantity for some years at least it will be at a diminishing rate.

NATURAL GAS. Ohio ranks third among the states in the value of nat-

ural gas produced. The fuel was first found in large quantity at Findlay in 1884, but it was used in so shameful a manner that the supply, large as it was, was soon exhausted. In 1887 gas was found in the Clinton sand at Lancaster, marking the opening of one of the finest fields of this fuel ever discovered. Since that year the drill has been busy and the field extended from near Logan on the south to the vicinity of Mt. Vernon on the north. The supply of gas has been very great and a large part of the population of our state is dependent on it. The limits of the field seem to have been practically reached and the outlook is not promising.

PEAT. Ohio contains a large quantity of this fuel, though the fact is not well known. The largest deposits exist on the divide between Lake Erie and the Ohio River. As yet they have not been worked, nor are they likely to be, so long as coal and other fuels exist in large quantity. They constitute a fuel reserve that will prove of great value to coming generations.

CLAYS

The best clays of Ohio are used in making pottery, an industry in which the state excels. East Liverpool leads in this industry but there are many other places where the work is on a large scale. Art ware is made at Coshocton, Zanesville and Cincinnati. The Rookwood art ware of the latter city has an international reputation.

Ohio leads in the manufacture of roofing tile and is second to Pennsylvania only in brick-making. The quality of the bricks is unexcelled. Shawnee, Perry County and Union Furnace, Hocking County are well known centers. Sewer pipe is another large industry and in this also our state holds first place. The state has the combined advantage of extensive clay deposits, nearby fuel, excellent transportation facilities, and proximity to the center of population.

The deposits of clay in Ohio are practically inexhaustible. To be sure the finest varieties are wanting, but very large quantities of good grade exist. The best of these are associated with the coal beds of southeastern Ohio, and are extensively worked.

The shales outcropping in central Ohio and along the Lake Shore in northeastern Ohio do fairly well for the more common products such as sewer pipe and bricks. The supply of the raw material of this grade is ample to meet the needs of the entire country for an indefinite period.

Over the glaciated part of the state is much clay that may be used for bricks and drain tile. Occasionally the quality is excellent, and bricks made from this material have found a market for one of the finest structures in New York City, and excellent buildings elsewhere.

BUILDING STONE

The Berea sandstone is one of the best building stones in this country. It has long been quarried on a large scale in Cuyahoga and Lorain Coun-

ties and has had an extensive market from New York to Chicago. Many of the finest structures, especially residences are made from it. The stone has a gray color when quarried but changes to a dull buff on exposure. It works well and is easy to carve. Other uses for it are pavements, curbings and grindstones. In fact it is the principal stone in the United States for the latter purpose. While the quantity of the Berea stone available is large it is far from inexhaustible.

Other building stones in Ohio are the Columbus, Niagara, Monroe and Cincinnati limestones. The first named is quarried at various places from Columbus on the south to Kelley's Island on the north. The State House is the best known structure built from it. The Niagara limestone is quarried at Springfield, and makes an excellent building stone. Greenfield, Highland County is the one center for the Monroe limestone. It occurs in thin even beds and is in every way desirable. Cincinnati has used much of it in former years.

The use of cement has greatly decreased the demand for building stone, so that many of the quarries are idle. In fact the Berea is the only one of the Ohio stones for which an active market is maintained.

Materials for Lime and Portland Cement

As all know lime is made by simply burning limestone, and in this work Ohio is very active. Formerly kilns were numbered by the hundreds, but with the concentration of industries lime making has become centered at a few points and is there generally conducted on a large scale. Springfield is the one important location in southwestern Ohio, but in the northwestern corner of the state lime is extensively burned at a number of places. The supply of rock is immense, the western half of the state being underlain with it and Ohio could produce enough lime to supply the whole United States.

For making portland cement a marl or limestone and clay are needed. Marl has been used in Logan County and is now in use near Sandusky, but elsewhere in Ohio, limestone furnishes the carbonate of lime. The clay is supplied either by beds of shale or clay. The quantity of these materials is large, and with a favorable market Ohio will become a very heavy producer.

Salt

When the pioneers first came to Ohio they were obliged to transport salt across the Appalachian mountains and this made it expensive. Later salt springs were found and the waters were evaporated in iron kettles. Wells were dug and stronger brines secured, and salt making became an important industry in the southeastern quarter of the state. Later, however, salt was made cheaper in New York and Michigan and many of the Ohio furnaces were abandoned. About twenty-five years ago rock-salt was found in drilling a deep well at Newburg, near Cleveland, and a salt furnace was soon in operation. The mineral was found at other places in that part of Ohio and now it yields great quantities of salt.

THE OHIO VALLEY IN RELATION TO EARLY OHIO HISTORY

By George W. Hoke

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THE Ohio river, with a drainage basin nearly as large as France, is formed by the union at Pittsburg, of the Allegheny from the north, and the Monongahela from the south. From Pittsburg it proceeds, with an average fall of five inches per mile, in a meandering course a little south of west, for about 967 miles to its junction with the Mississippi at Cairo. The Ohio valley consists essentially of a main stem opening freely westward, and surrounded on the other three sides by a more or less broken upland. The two source streams form a great crosshead, intercepting, for a distance of more than 300 miles the roads across the mountains, and converging them upon the main stream. On the Kentucky side the bold, irregular front of the upland trends south-westward, thus receding rather rapidly from the river. Gaps in this wall lead from the Ohio valley into the long trenches of the "Greater Valley," and ultimately, by circuitous routes open out upon Pennsylvania, Maryland, Virginia, and the Carolinas. In this manner the southern arm of the "crosshead" is greatly extended. North of the Ohio the narrower and lower uplands follow the river somewhat more closely and end in eastern Indiana.. They too are broken by a series of gaps which, while they permit uninterrupted intercourse between the Ohio and the Great Lakes, at the same time definitely localize highways of communication. These gaps are the fertile valleys of rivers that now drain southward into the Ohio, though perhaps their former course was northward to Lake Erie. Their tributary streams give easy access to the uplands which rise very gradually from the lower land. Thus from Canada to the Carolinas, roads converge upon the Ohio valley.

The convergence of Alpine roads upon Italy made the Po basin the cock-pit of Europe. Similar relations rendered India a melting pot of nations. Likewise in the Ohio Valley the challenge rang: "let him take who has the power, and let him *keep* who can." It is a fairly typical concentration area. Under Indian occupation it never became more than a transition zone penetrated from time to time by hunting or warlike expeditions, but none of the tribes were strong enough to take and hold it against the rest. For a time the valley promised to become a cock-pit for France and England. In fact, Ohio history opens with the French in possession of the basin of the Saint Lawrence, and eager to add the Ohio to their domain. But their access to the valley was somewhat hampered by the presence of the unfriendly Iroquois. And so when Ft. Duquesne fell before General Forbes in 1758, French rule on the Ohio came to an end. The exploiting ideals of the French, and the lack of geographic features

enforcing intensive development in the regions possessed by them, resulted in an occupation of territory too diffuse to offer effective resistance to the advancing tide of English. The land was thus permitted to lie fallow while the colonists, hemmed in on the Atlantic sea-board were acquiring an energy that was to make their westward movement effective. Thus denied the distinction of becoming a foreign cock-pit, it became a domestic melting-pot, in which were fused the elements that give character to the Ohio American.

By the elimination of the French, the English held virtual possession of the land as far west as Pittsburg. The Indians claimed the lands on either side of the Ohio, and the Crown, in 1763, even went so far as to issue a proclamation forbidding settlement. But the frontiersman had already found his way through the Cumberland Gap into that debatable "no-man's-land" of Kentucky, and had given battle to the Indian. The Warrior's Path and the Wilderness Road saw many a fierce contest. However, owing to the disorganized state of the Indians, the resistance was sporadic. This lack of unity was due, not only to the low social status of the tribes living under the hunting regime of the forest, but also to the fact that they were defending a transition zone in which mutual rivalry was scarcely less bitter than their common hatred of the intruding white. By the treaty at Ft. Stanwix in 1768 the lands were opened for settlement. The transplanting of Virginia ideals and customs followed apace. By 1785 more than 100,000 people were settled on the fertile bottom lands of West Virginia and Kentucky. Thus early the cavalier of the Old Dominion planted the nucleus from which was to develop the horse-racing, slave-holding, aristocratic society of the Blue-grass country.

From 1768 to 1785 the Ohio formed the real Indian frontier, whatever its legal status may have been. By the treaty at Ft. McIntosh, however, the United States secured, from the actual Indian occupants, the first grant of land north of the Ohio. Congress at once ordered the land surveyed and sold. Various companies were formed to establish settlements in the new country. The Ohio Land Company sent out a party of settlers from Connecticut, and they established the town of Marietta at the mouth of the Muskingum in April, 1788. In December of the same year, settlers from New Jersey and Pennsylvania located on the Symmes Purchase, near the present site of Cincinnati. In like manner the Virginia Military Reservation on the Scioto, the Western Reserve on Lake Erie, and the Seven Ranges stretching across the uplands, were laid out and settled by people from Virginia, New Jersey, Pennsylvania, New York, and New England. It cannot fail to strike the attention that these growing points, at Pittsburg, in the Blue-grass country, and in Ohio, occupied strategic positions with reference to the upland gaps. Nor would it be easy to overestimate the effect upon the character of the people, of the intimate mingling of ideals and blood of Puritan, Cavalier, and Quaker that has taken place upon the fertile soil of the Ohio Valley. The position of that valley,

and the configuration of its border land converging there-on widely divergent roads, has thus served to mark it out, first as a transition zone between wandering tribes of Indians, then as a contact zone between hunter and husbandmen of the Indian frontier, then as the occupation zone of a highly organized population, differentiated on one side into the aristocratic Kentucky type, and on the other, into that composite agricultural, industrial, and commercial type.

THE DEVELOPMENT OF CINCINNATI

By Irving R. Garbutt, Head of Commercial Department

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THE site of Cincinnati is favorable to commerce, and health. About 1786 an expedition for trade with the Indians was undertaken by a party from Pennsylvania. This expedition down the Ohio river seems to be the circumstance which brought to notice the advantageous site. The leader of this expedition interested others and formed a company of twenty-four men who obtained a deed from Congress for the land now known as the Miami country. The following year the first cabins were built.

The first settlers found a great plain, the bed of an ancient river. The glacier had caused this bed to be filled with deposits of sand, gravel and boulders and thus transformed it into a broad valley. The former banks appear as true hills, some of them 450 feet high and of great beauty. These general features still remain though the growth of the city destroyed the dense woods of sycamore, maple, beech and oak which covered both hills and plain. This great plain, encompassed by "twice seven hills" and now filled almost exclusively with business, was rich bottom land. Leading along the banks of the Little Miami and Mill Creek were valleys destined to be great thoroughfares connecting localities which began as separate settlements but became in time a part of the whole.

The first settlements, after passing through periods of Indian wars and pioneer privation, became largely agricultural. Agriculture with hunting and trapping produced the first surplus articles which formed the basis of the early commerce of the Ohio Valley. Turnpike companies were formed and roads built connecting with towns in the interior of the state. The Miami canal furnished connection with the Great Lakes, but to the Ohio river Cincinnati owes all its early growth and development. All the early traffic and the first settlers were borne on its current. It long continued to be the chief connection between east and west. The crafts

used first by the white man and until the time of the steamboat were keel boats, barges and flat boats. The steamboat era followed and from that day the river has brought continually to the doors of Cincinnati coal from the east, lumber, salt, clay and other products from the mountains of West Virginia and Kentucky.

Through the river, canal, turnpikes and finally the great systems of railroads, centering here and diverging in all directions, were established the conditions under which Cincinnati has grown into a great commercial city.

After the civil war came a period of rapid growth of railroads and Cincinnati being a terminal for many railroad lines quickly recognized its opportunities and by industrial development sought to meet them. The principal items of commerce nearly all show steady and substantial evolution anl growth. The abundant and cheap coal supply with the necessary raw materials near at hand made this city develop rapidly as a manufacturing center. Its location was especially suitable for marketing of lumber, tobacco, cotton, wool, livestock and hides.

As a city Cincinnati has been the focus of various streams of life which have here met and mingled. The climate is not attended by extremes of temperature and the healthfulness ranks high. The city has passed from commercial preeminence to industrial preeminence. This industrial development has not been one-sided. "The lines of industry include the manufacture of clothing, shoes, soap, leather, harness and saddlery, vehicles, furniture, machinery for woodwork, machine tools, office and bank equipment, veneering, school books, lithographic and other high class printing, printing inks, whisky, beer, pork and beef products, pianos, and other musical instruments, decorative pottery, etc."

LAKE ERIE AND ITS SOUTHERN PORTS

By W. E. Durstine

Technical High School, Cleveland, Ohio

ONE of the important results of the last invasion of the great ice sheet was the formation of Lake Erie. The influences of this lake are many and far-reaching. Among the things affected are the following: location of industrial cities from other natural resources, climate of the surrounding region, freight routes and rates, food supplies, water supply for the cities, and the cost of power for manufacturing and transportation.

During the open season a boat passes out of or into Lake Erie every twelve minutes and the Lake Erie ports receive 85 per cent and ship 24

per cent of all freight that passes over the Lakes. The harbors of this lake are the mouths of small streams and consequently in the busy season shipping is congested.

Along the southern shore of Lake Erie have grown several cities that owe their importance to their location on the lake. "Gold is precious but iron is priceless," and at these cities the ore from the upper lake regions meets the coal of Pennsylvania, Ohio and West Virginia. These ports receive 83 per cent of all the ore shipped over the lakes and the chief receiving cities are: Ashtabula 20 per cent, Conneaut 17 per cent, Cleveland 15 per cent, Buffalo 12 per cent. Trains bring coal to these cities and return loaded with ore. With the discovery of iron ore in the northern lake regions has come the shifting of the centers of iron manufacturing from southern to northern Ohio.

Many of the ore boats return with cargoes of soft coal. Of this, Lake Erie ports shipped 94 per cent in 1909, distributed as follows: Toledo 23 per cent, Ashtabula 20 per cent, Cleveland 18 per cent, Lorain 12 per cent. Lake Erie ports shipped nearly 6 per cent of all the hard coal mined in the United States, 85 per cent of this leaving the port of Buffalo. Iron manufactures make up another return cargo, Cleveland shipping 45 per cent and Buffalo 30 per cent of all such shipments over the lakes.

The change of the wheat producing region from the west to the northwest has made Duluth, Superior and West Superior the chief ports for the shipment of wheat. However, the amount of wheat shipped over the lakes is decreasing for more is consumed at home and much of the wheat producing area is in Canada. This wheat would find a ready market in the United States but the high tariff prevents it entering the country except in such amounts as the millers need to mix with the home grown wheat to make the best grades of flour.

Lake Erie ports receive almost all of the grain shipments; Buffalo being the chief port, receiving of the wheat 87 per cent, corn 70 per cent, oats 64 per cent, rye 50 per cent, flaxseed 83 per cent, flour 60 per cent, barley 67 per cent.

Buffalo is destined to become one of the largest inland cities in the United States because of its location at the eastern end of 1000 miles of inland water-way system and at the western end of the Mohawk depression. When the improvements of the Erie Canal are completed its importance will be much increased. Now the canal will admit boats of 240 tons, then 1000 ton boats can be accommodated, thus reducing the freight rate to probably one-fourth of the present charge. Even now it leads the cities of the lakes in receipt of inbound freight.

Buffalo will be vastly influenced in its development by the "white coal" of Niagara Falls. This inexhaustible supply of power is equal to one-fourth of that now developed from soft coal in the United States.

This allows a very great expansion of manufacturing in the Buffalo region. Many of the industries that are grouped around Pittsburg and other cities on account of cheap coal can find still cheaper power near Buffalo. Here power can be furnished for one-fifth what it costs in New York City, one-fourth in Cleveland and one-half in Pittsburg. It has been estimated that power can be produced for $10 per horse power per year and still pay all expenses and 4 per cent on the investment. Niagara is capable of saving, on account of the greater efficiency of electricity in factories, etc., enough soft coal to fill annually 50,000 trains of 50 ton cars, 40 cars to the train. In other words, a saving of more than one-fifth of all the soft coal mined in the United States in 1907 can be made. Within a radius of 500 miles of Buffalo live 60 per cent of the entire population of North America. Therefore, the geographical advantages of Buffalo are: its vast market near at hand, 1000 miles of inland sea route, the Erie canal and the St. Lawrence river connecting it with the tide water and the perpetual cheap power of Niagara Falls.

The early settlement in the vicinity of Cleveland was made at Newburg Heights because of the malarial condition at the mouth of the Cuyahoga river. When the Ohio and Erie canal, connecting Cleveland with the interior of the state, was opened in 1835 the city began its real growth. The country along this canal had been practically isolated and farm produce was almost worthless because of the lack of transportation facilities to market. Corn sold for ten cents and wheat for twenty-five cents per bushel. But the canal changed all this. Cleveland was favorably located to receive the benefits of this trade. Along with the farm produce came pig iron made from the bog ore of Summit County, wool, clothing, timber and coal. So the city became not only a distributing point but also a manufacturing center. Along the course of the river for several miles from the lake the flats are suitable for docks, yards, warehouses and factories. The crookedness of the river increased the river frontage and so was of great advantage in the early days. But with the advent of the 600 foot freighter, this condition became a hindrance and many shippers are now seeking more favorable ports, which are not so congested. Cleveland was the principal ore receiving city on the lake because boats could unload at the furnaces. The valley has become filled with steel mills and allied industries. This same valley forms an easy grade for the transportation of coal from the coal districts for the factories and also for trans-shipment over the lakes.

The harbor of Cleveland finally became so congested that some method of relief was sought. Ashtabula and Conneaut afforded ample harbors with cheap land adjoining. Railroads were easily built from these places to the coal fields. The owners of the ore, ore boats, railroads and coal fields were very closely affiliated and were very quick to see the advantages afforded by these two ports for the trans-shipment of coal and ore.

So docks were built equipped with the latest machinery, and ore can be handled for ten cents per ton. These two cities are not as large as might be indicated by the amounts of receipts and shipments for most of the work is done by machinery and very little by hand labor.

The original settlement near the site of Toledo was at Old Fort Meggs, about ten miles up the Maumee river, but with the development of the country, boats were in demand to sail the Great Lakes. Around the mouth of the river were abundant forests and soon ship-building became a thriving industry. Then Toledo began to grow. With the depletion of the forest and the advent of the steel freighter the building of wooden ships became less important. Wooden manufactures as wagons, cars and agricultural implements are important products here.

The railroads connect this city with the extensive coal fields of West Virginia and as this port is a convenient place to exchange cargoes of ore and coal, Toledo has become the chief port on the lakes for the shipment of coal. The railroads have provided ample yards and coal handling facilities. As might be expected, large steel mills have seen the advantages afforded and have located here. Other industries, which depend upon steel are also numerous. One of the largest and best equipped ship-building yards has been constructed here as cheap steel is easily obtained and the water front affords ample room for the construction and launching of ships.

THE ISLANDS OF LAKE ERIE

By W. P. Holt

Central High School, Toledo, Ohio

THE islands of Lake Erie are situated in the western end of the lake and consist of the five larger islands, viz: Pelee (11,000 acres), Kelley's (3,000), South Bass or Put-in-Bay (1,500), Middle Bass and North Bass. Among the dozen or more smaller islands may be mentioned West Sister, Middle Sister, East Sister, Green, Rattlesnake, Sugar, Middle, and the Old Hen and Chicken group.

The shallower water of the western end of the Lake, as well as the presence of the islands here located, is accounted for by the axis of the Cincinnati anticline passing through this western end of the Lake. All of the islands belong to the eastern half of this truncated fold. The western islands of this group (with the possible exception of East Sister Island) are included in the "Waterlime, or Lower Helderberg" of the Upper Silurian, while the eastern or Pelee-Kelley's Island chain belongs to the "Corniferous" limestone of the Devonian.

All of the Lake Islands are strikingly plowed and furrowed by glaciation; probably no part of the Northern Hemisphere can show more remarkable examples. The grooves here shown are known to all students of glacial geology. "Most of these glacial furrows have a bearing nearly coincident with the longer axis of Lake Erie showing that the ice masses by which they were formed moved in that direction. The evidence is no less conclusive that the motion was from the east end of the lake toward the west." Not only is the surface glaciation most remarkable, but even lateral planing, fluting, and under-cutting is strikingly illustrated. A few years ago when the "stripping" was being removed from the bedrock for a Kelley's Island quarry, a long deep groove was exposed with a crystalline boulder still in place at the end of the groove that it had been forced to make.

No account of the natural attractions of the Lake Erie Islands could well omit some mention of the caves of South Bass Island, or Put-in-Bay. Although only eight miles distant from Put-in-Bay, Kelley's Island (Devonian) has no caves, while Put-in-Bay (Upper Silurian) is more or less honey-combed with them. The latter is naturally thousands of years the older and is extensively fissured, while the bedrock of Kelley's Island is practically free from fissures.

Perry's Cave, the largest, bears the name of the great naval hero of the Battle of Lake Erie. While historically certain that Perry "put in" to the "bay" of this Island—since called Put-in-Bay—it is by no means certain that Perry hid a part of his stores here at any time.

Crystal Cave, which in reality is a gigantic geode, is lined with by far the largest crystals of celestite in the world, the largest of these being 16—18 inches in length and remarkably well formed. Crystals of celestite also occur in Green and other islands.

From the main part of Paradise Cave (which has the largest stalactite on the Island) one can look through the crystal water into a lower side chamber, now filled with water, and see an actual submerged stalactite several inches in length. These submerged stalactites and stalagmites, which could only have been formed in air, are mute but indisputable evidences of the subsidence of the south-western portion of Lake Erie basin, or possibly of a still earlier preglacial time when the present Lake Erie did not exist.

The soil is a mixture of glacial clay and the disintegrated limestone bedrock, and is well drained, although there are no surface streams. Owing to the equable climate, in large measure due to the surrounding expanse of water, late killing spring frosts are almost wholly unknown, and the early fall killing frosts come 2—4 weeks later than on the main land—thus giving a longer growing season. Fruit growing is by no means confined to grapes for which this region is celebrated but includes both peaches and plums, and other fruits.

In considering the origin of the island flora—always interesting to the student of plant geography—it is further suggested that the striking similarity between the insular flora and the flora of the main land is very probably due to a comparatively recent post-glacial land connection between the islands and mainland.

A low island of the Old Hen and Chicken group, uninhabited by man, is the breeding ground of the Wilson's or Common Tern; and to one who has never seen a breeding ground of water birds it is well worth a visit. While Put-in-Bay is an attractive summer resort for man, it is an equally attractive winter resort for the Herring Gulls which breed further north and are seldom seen in Lake Erie in summer, but return in the fall and are attracted in large numbers by the winter fishing so extensively carried on through the ice by the residents of Put-in-Bay. The small fish discarded by the winter fishermen are carefully picked up by the gulls.

Although not an island of the open Lake, Johnson's Island of 300 acres in the northern part of Sandusky Bay is well known historically on account of the rebel prison erected there in 1862. Over 15,000 southern prisoners were confined here up to the close of the Civil War, as many as 3,000 at a time, largely officers. The unsuccessful conspiracy in 1864 to release these prisoners is a matter of history. The Island was originally heavily timbered, and a favorite resort for the Indians.

A closing word should be added concerning Catawba "Island"—an "island" and yet not an island. On the map it appears a closely landlocked shore island, three miles due south of Put-in-Bay. It is one of the most successful and best known peach districts in the United States today. The proximity to the Lake and the resulting immunity from killing spring frosts not only protects the earlier varieties, but affords a longer growing season for the later varieties.

THE TEACHING OF PHYSICAL GEOGRAPHY IN OHIO

By George R. Twiss

High School Visitor, The Ohio State University, Columbus

PHYSICAL Geography is included in the courses of nearly all of the 975 high schools of this state and is usually a half-year course in the first year. In the better class of schools the text books are mostly of the present day type; but in very many of the smaller and weaker schools, revamped editions of the type common in the early eighties are in use.

In the absence of definitely analyzed statistics, it may be estimated that 90 per cent. of all these schools have no special equipment for the

teaching of physical geography. Of the remaining 10 per cent probably it would be fair to say that not more than half, or 5 per cent of the whole, have more than a set of six or eight wall maps of medium or poor quality, or a set of "politico-relief" maps, and a globe. About a score of our largest cities are supplied with generous equipments which is good in some phases but not well balanced. In one city the geographical equipments in several of the high schools surpass those of all but the strongest colleges in the state, and compare favorably with those in the very best high schools of the country.

Not more than 5 per cent make any claim to having teachers of this subject who have had adequate training in it, or of requiring laboratory or field work of any kind. It is the subject usually given to the teacher who is willing to take what none of the other teachers want.

If these estimates are any where near correct,—and in the personal opinion of the writer there is a large error on the side of liberality—it may be inferred by the reader that in more than 95 schools out of every hundred in Ohio the work in Physical Geography consists almost exclusively of text book recitations, more or less mechanically carried out. According to the writer's observation a constructive, consecutive, cumulative recitation is very rare indeed. By such a recitation is meant one in which a concept is developed from particular facts and conditions that are already woven into the pupils' minds in concrete form, and the concept then tested in its applications to other conditions. Occasionly one may be delighted by witnessing just such a lesson, and occasionally also he may find the problem method used. Teaching of this kind, done of course with various degrees of skill, is not uncommon in our best high schools in Physics, in Chemistry and even in Botany and Zoology. One may even find it here and there in History and Civics; but to find it done in a masterly way in Geography is a very rare experience to the writer.

As a typical example of what the writer is accustomed to witness in high school geography classes, a lesson on the Allegheny plateau may be mentioned. The statements of the text were elicited from the pupils by naming topics, or by questions often more or less suggestive of what the answer should be, the pupils usually reacting to the words or acts of the teacher as stimuli, rather than to the subject-matter. Not a map was unrolled, not a topographic sheet displayed, not a model examined, not a picture or lantern slide shown. The pupils were showing a creditable amount of the kind of intelligence that can be gained by the study of texts coupled with chance observation; but they seemed to have little or nothing of the "geographic sense." Not a reference was made to the fact that the border of that plateau is within twenty-five miles of that school house. Two questions by the visitor elicited the facts, (1) that not one pupil in the class could name an Ohio town within the border of that plateau or a railroad by which he could get into it (2) several of the class

had traveled into it over railroads, or had been in towns within it, but had been unaware of the fact until that moment. There had been a total neglect of making the whole thing meaningful by connecting it with the things that are significant to the pupils. There was at hand an abundance of material, of the sorts mentioned, for developing a vivid concept of the region and tracing its relations to the life problems of the state and the particular locality, but no reference whatever was made to it in that lesson.

The reasons for the conditions herein outlined are easy to state:

(1) Those who are responsible for the schools do not require thorough training on the part of the teachers assigned to this subject, and they do not couple such a requirement with inducements in the shape of good salaries and ample time for daily preparation, such as will attract high grade people to prepare themselves properly for this kind of teaching.

(2) They do not see that the teaching is carefully supervised and constructively criticized.

(3)They do not insist that teachers of this subject read books, magazines and reports on the content and the teaching of the subject, and study systematically to improve their methods.

NOTES ON OHIO'S RAILROADS AND INDUSTRIES

By G. D. Hubbard, Oberlin College

Ohio has about 10,000 miles of railroads and 5,000 miles of interurban electric roads. Only four States have a larger mileage of railroads.

Eight great trunk lines for east and west through traffic cross the State,—the B. & O. in the south and again in the central; the Nickel Plate and Lake Shore in the north; the Big Four, Erie and two Pennsylvania lines in the central part.

Three lines penetrate the south from Cincinnati.

Ohio owes much of its development to its position, on great through routes, Ohio river, Great Lakes and trunk railroads.

Over 40 different railroad companies operate in Ohio and some of them control several lines.

Over 60 different interurban electric companies operate in the State.

Ohio is the first State in the manufacture of clay products as pottery, brick, and tile, with an output valued at $30,000,000.

The total true valuation of all property both personal and real is placed at over $6,000,000,000 (1900).

There are 275,000 farms in the State with an average size of 88 acres.

In 1909 they produced: Wheat, 23 million bushels; corn, 153 million bushels; oats, 56 million bushels; potatoes, 16 million bushels; barley, 827 thousand bushels; rye, 980 thousand bushels; and 83 million pounds of tobacco.

In 1910 Ohio had a million horses and mules, 2 million cattle, 3 million sheep and 2 million swine, and produced 100,000,000 pounds of butter and cheese, and 100,000,000 dozen of eggs.

The fisheries of the State (lake, river, canal, and glacial pond) yield annually nearly a million dollars.

Once the leading wool State, Ohio ranks seventh now because her lands are worth more for intensive agriculture while western lands are excellently adapted to sheep grazing.

Ohio has 12,000 square miles of coal lands, and produces annually nearly 30,000,000 tons of coal, or about one-eighth as much as Pennsylvania.

The State produces some 25,000 tons of iron ore, and then imports enough more to make 5,000,000 tons of pig iron taking second rank in the latter.

The towns of the northeastern part of the State are admirably situated for iron manufacture, between the lake ports and the coal fields.

Ashtabula handled more iron ore in 1910 than any other lake port.

Ohio ranks third in the production of salt with about 3,500,000 barrels, recovered entirely from brines.

Ohio ranks fifth in petroleum, with 10,000,000 barrels, or about one-twentieth the total, for the United States. Ohio's output is declining.

Ohio produces $9,000,000 worth of fruit of which one million is for grapes along Lake Erie in northeastern Ohio. There might be much more fruit produced in Eastern Ohio.

The annual rainfall is 40 inches east of Cleveland along the lake, but over the rest of the State ranges from 30 to 40 inches, amply sufficient for agriculture and well distributed through the year.

The mean annual temperature ranges from 55 degrees around Portsmouth to 48 degrees in the extreme northeast.

Great diversity of industry has done much to distribute Ohio's wealth among her citizens.

Lake commerce in iron ore, furniture, lumber, grain, and stock is very important although navigation is closed by ice several months of the year.

GEOGRAPHIC INFLUENCES AFFECTING EARLY CINCINNATI

N. M. FENNEMAN, University of Cincinnati[1]

CINCINNATI marks the site of the first settlement made by men of the thirteen colonies on the typical soil which makes our greatest agricultural region. The "Miami Country" is the glaciated equivalent of the Blue Grass Region of Kentucky which was settled some fifteen years earlier.

The order in which places are selected for settlement in a virgin country offers the inevitable suggestion that those first chosen possessed some advantage, industrially, commercially, or strategically. But the order of settlement is determined quite as much by the motives of the settlers as by the nature of the country. On this account we observe what seems to us now a curious occurrence,—the settlement of central Kentucky before the banks of the Ohio. We are now so accustomed to the motives of trade that it is hard to understand the occupation of a region which is accessible only by wilderness roads while leagues of fertile country remained unoccupied beside a great natural highway like the Ohio river.

If the first great geographic fact concerning the Miami Country was its resources, the second was its location on what has always been the most used navigable stream in the United States. Commercially the new settlement was more closely connected with New Orleans than with any place in the thirteen colonies. Before the advent of the steamboat in 1817, prodigeous quantities of flour, pork and whiskey were floated to New Orleans to be reshipped thence to ports on both sides of the Atlantic.

The third great geographic fact is of more interest than either of the others; namely, that a natural north-south highway connects the prairies of western Ohio with the Blue Grass Region. It is not the Little Miami (important though that is) whose broad valley ends within the limits of the present city, nor is it the Great Miami which joins the Ohio some miles to the west. It is a broader valley than either of these streams have, and much broader than that of the Ohio itself. It was excavated by the predecessor of the Ohio which flowed north from the site of Cincinnati to Hamilton and thence perhaps westward. In line with this same great highway and leading south from Cincinnati is the open valley of the Licking which leads to the heart of Kentucky.

From time immemorial the Indians knew and followed this route. Mathias Denman, who, before the original settlement was made, bought the ground on which the business section of Cincinnati stands, intended not only to found a town but to "establish a ferry." Later that ferry and others beside it became enormously important. In 8 months of the year 1805 one of these ferries brought in from the southern states 2629 immigrants. The place of these ferries is now taken by five great bridges, a part of man's response to Nature's clear suggestion.

[1]For some of the historic facts here cited the writer is indebted to Mr. Frank P. Goodwin of the Woodward High School, Cincinnati.

EDITORIAL

Present Problems in Elementary School Geography

Modern elementary geography has a complexity and diversity of subject-matter that was unknown thirty years ago. The older geography dealt with the memorizing of unrelated facts and simple rational explanations were unknown. Nothing was then taught embodying the elements of climate, the soil, home geography and the occupations of man. The new ideas which have complicated the subject-matter are the result of an educational growth and progress which has been generally approved by modern educators who consider them vital factors of this elementary subject.

With the introduction of this new material into geography less time has been assigned it in many cities than thirty years ago. This gradual acquisition has resulted in a confused idea concerning the content of geography and a critical valuation of the old and new subject-matter is necessary. A few of the larger cities have attempted some readjustments by increasing the time, some simplification of the content or a definite selection of the important topics.

In the valuation of the material for elementary geography the following factors must receive consideration:—The adjustment of the subject-matter to the needs and the interests of the pupils rather than its logical arrangement, the more extensive study of the occupations and the industries, a definite home geography, modification and considerable reduction of the physiographic processes, a more general use of the map, concrete problems of human interest rather than equal emphasis given to both the essential fact and the trivial detail, the character of location exercises and the wider use of illustrative material.

The large number of children withdrawing early from school, demand that a knowledge of the state, country and a minimum of world geography be taught early in their course. In this the major emphasis properly belongs to the United States and Europe. The fact that nine-tenths of the pupils will enter industrial life and the rapidly increasing importance of the industries, require that the essential facts of these activities occupy a prominent place in the modern school. The soil, relief, climate and drainage are more concrete to the child if they are shown to be the controlling factors in the great industries which make modern life possible.

Home material should be organized and adapted by teachers so that it is a source of definite information and a basis for the elementary instruction. A local club for the study of home geography is valuable, if the ideas gained from the field trips are discussed and organized. In some of the large cities geographical clubs have issued pamphlets which furnish

considerable material for the teaching of local geography and history. The members of such a local club should take an active interest in the selection of modern text-books and the necessary equipment of their schools with maps, globes, charts etc.

The stereotyped definitions in many of the present texts are so broad in their generalizations, that their value to the pupil is questioned. There has been in the last five years considerable reduction in the physiographic material in the elementary course, and still more elimination of technical terms and genetic ideas is advisable. Geographic descriptions suitable for elementary instruction should be more carefully worded than in some of the modern texts where they are vague and misleading.

The study of the map and its practical use should receive greater emphasis. The interpretation of geographic relations from a clear wall map will yield results that few teachers appreciate. Pupils should acquire the knack of rapidly sketching memory maps which illustrate certain definite features. No time should be given to the tracing of the detailed features of an irregular shoreline nor devoted to outlining a continent by an elaborate system of longitude and latitude. Blank maps for each pupil are essential in the distribution and progressive studies of climate, surface and commercial relations. Large blank wall maps are valuable in the class discussion of the resources, relief, drainage and any data that the teacher can readily plot thereon. Elementary geography in this country needs wall maps, charts and diagrams that are simple and clear in their delineated features and adapted to the capacity of the pupil. The American Geographical Society has given a distinct service to education in its traveling exhibit of foreign maps, and there remains a similar duty in a compilation of the American published maps accompanied by a statement of merits, defects and details of price, publisher, mounting, editions etc.

Elementary geography is essentially a fact study. Its content is chosen for the information it yields concerning the relation of life to the earth. Its proper study leads to a rational understanding of the world relations or else geography is merely catechistical. Geographical facts are arranged in distinct groups which are governed by simple and widely recognized principles. This demands the use of the problem which compels the teacher to select the essential from the non-essential in the text and offers an effective training to the pupil. It demands the thoughtful study of the lesson and eliminates "pretty talks about things in the country" which some educators declare is the method of the average teacher in presenting geography. The abandonment of the text by the teacher is deleterious to the progress of the pupil and his habits of study. Few teachers can substitute as suitable material as that of the discarded book. The mastery of the essentials of the text would lessen the confusion of ideas and remove the cause of considerable criticism.

The present elementary geography is criticized for the failure of its students to locate places. From what these critics advocate it seems as if they regard the mere location of places as the sole result to be sought by geography study, but they have obviously forgotten the blighting influence of the once popular but absurd songs of capitals, capes, islands and bays. The pages of a modern text devoted to North America has several hundred more places to locate than a similar text of a generation ago. The places to locate are more numerous now, but some phases of modern geography are of greater value to the child than the mere mechanical location exercises. The plea, for such mnemonic work, indicates a serious neglect of the atlas and the map in the elementary school and a disregard of their habitual use. Why not be as sensible in the use of the map and the atlas as the dictionary? Let the teacher realize that work is half done when the history and the reading classes are conducted without the use of the map. In modern school geography the location of places is only one of the essential items which constitute the study of the earth and its life. A list of the essential places for location might be formulated but with such a name catalog there is a danger of this one geographical item excluding all else.

The necessity of illustrative material in geography is widely recognized by educational authorities. The modern texts have a generous assortment of pictures and maps, but the school equipment of globes, wall maps, charts, pictures, specimens, products and lantern slides is extremely scant in the elementary schools of the large cities. In one large city the cost of the geographical equipment in a single high school exceeds the total value of all the maps and the materials for the teaching of geography in one hundred elementary school buildings. If this is the country wide distribution of funds for this subject, it is a doubtful educational policy. A bureau of exchange among teachers would encourage the use of materials, products, pictures etc. Such an organization was effected in 1899 in connection with this Journal and it promised considerable aid; a trial showed its need and likewise its labor and expense. There are many teachers who have collected considerable material and have it organized as an effective aid to their instruction. This Journal will publish from time to time short articles relating to the use, organization, sources and character of illustrative material.

These ideas concerning some of the vital problems of elementary geography, are presented to arouse a much needed consideration of the whole field embraced by this subject. Radical reform in the present methods of teaching geography is unnecessary, but the purposeful organization of the subject-matter for the benefit of the pupil, the elimination of the non-essentials, the wider use of illustrative material and the more rigorous contact of teacher and pupil with the text are very desirable.

W. M. GREGORY

GEOGRAPHICAL BOOKS FOR ELEMENTARY SCHOOLS

The following lists of books for grammar and elementary school geography are suggested as a nucleus for a library in an elementary school building or a teacher's private collection. The books are chosen rather for the practical assistance that they provide than for extensive reference. These books would be an essential part of a local geographical club's library or constitute a circulating library under the control of a county commissioner. Each list of the following books costs approximately twenty-five dollars each.

Grammar School List

International Geography, By Mill. Appleton Co. $3.50
Geographic Influences in American History, by Brigham. Ginn & Co. 1.25
Commercial Geography, by Robinson. Rand McNally & Co. 1.25
Industrial Studies—United States, by Allen. Ginn & Co. ..... .65
Advanced Geography, by King. Scribners Sons. 1.20
Advanced Geography, by Dodge. Rand McNally & Co. 1.20
New Geography Book II, by Tarr and McMurry. Macmillan. 1.10
The World, by Lyde. A & C. Black. 1.00
Man in Many Lands, by Lyde. A. & C. Black. ..... .65
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